FISH SAMPLING

Purpose

This Meteorology and Air Quality Group (MAQ) procedure describes the collection of fish samples using gill nets as part of the foodstuffs monitoring program.

Scope

This procedure applies to the individual(s) assigned to collect fish as part of the Foodstuffs Monitoring Program.

In this procedure

This procedure addresses the following major topics:

Signatures

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Approved by: Terry Morgan, QA Officer	Date: 05/10/05
Work authorized by: Dave Fuehne, Acting MAQ Group Leader	Date: 05/10/05

05/12/05

General information about this procedure

Attachments

This procedure has the following attachments:

Number	Attachment Title	No. of pages
1	Hazard Review	2
2	Fish Collection Locations and Physical Characteristics	1

History of revision

This table lists the revision history and effective dates of this procedure.

Revision	Date	Description Of Changes
0	6/28/96	New document.
1	3/99	Reformatted in accordance with LIR300-00-01, Safe Work Practices
2	4/01	Added new Section 9.0, Training
3	4/02	Added new text regarding electrofishing procedures.
4	4/03	Team name change to Environmental Surveillance.
5	5/12/04	Updated and reformatted document to conform with MAQ procedures.
6	05/11/05	Replaced HCP with HR, added euthanization steps, added prerequisite for animal use committee approval, and removed electroshocking steps and attachments.

Who requires training to this procedure?

The following personnel require training before implementing this procedure:

- MAQ personnel assigned to collect fish samples

Training method

The training method for this procedure is **on-the-job** training by a previously-trained individual and is documented in accordance with the procedure for training (MAQ-024).

Annual retraining is required and will be by self-study (“reading”) training.

General information, continued

Prerequisites

In addition to training to this procedure, the following training is also required prior to performing this procedure:

- First Aid
- Cardiopulmonary Resuscitation (CPR)
- RRES-ES-Field, "General Field Safety for All Employees"
- MAQ-710, "Boat and Raft Safety"
- New Mexico *Better Boating and Regulations*
- approved integrated work document (IWD)

The following documents are also required:

- An animal use protocol approved by the LANL Institutional Animal Care and Use Committee (IACUC Protocol 04-59-02R).
- NM Dept. Game & Fish Permit (2864)

At least one person in each field crew must have the following training:

- New Mexico Boating Safety Class (offered by State of NM Parks Dept.)

All participants in fish sampling on the water must know how to swim.

Definitions specific to this procedure

Foodstuffs: produce (fruits, vegetables, and grains), fish (surface feeders and bottom feeders), eggs, milk, brewed tea, honey, and game animals.

Gill nets: nets stretched across a body of water to capture fish for sampling. Nets are about 100 feet long with weights on one side and floats on the opposite side so it forms a "wall" when deployed. Usually kept in place for (no more than) 24 hours.

Dip nets: nets used to scoop fish from the water.

References

The following documents are referenced in this procedure:

- MAQ-024, "Personnel Training"
- MAQ-708, "Recording Chain-of-Custody Data for Soil, Foodstuffs, and Biota Samples"
- MAQ-710, "Boat and Raft Safety"
- MAQ-Field, "General Field Safety All Employees"
- New Mexico Better Boating and Regulations
- IACUC "animal use protocol" (04-59)

Worker Safety

Precautions and limitations

Work must be performed in conjuction with an approved integrated work document (IWD).

Safe work practices requirements

Project Personnel – A minimum of three people is required to go out in the field – one driver and two to place nets.

Personal Protective Equipment – See equipment list on page 6 of this document.

Do not perform work under conditions you consider unsafe. Before beginning work described in this procedure, review safety needs and requirements, identify hazards, and develop hazard mitigation measures.

Sample Collection

Permit needed

Before any work begins, a permit for scientific collection must be obtained from the New Mexico Department of Game and Fish. The application form, *Authorization for Taking Protected Wildlife for Scientific and/or Education Purposes*, may be requested from the New Mexico Department of Game and Fish, PO Box 25112, Santa Fe, MAQ 87501.

Sample types

Two categories of fish are collected:

- predator feeders: rainbow trout, brown trout, kokanee salmon, largemouth and smallmouth bass, white crappie, and walleye
- bottom feeders: white sucker, channel catfish, carp, and carp suckers

Sample locations

Fish samples, both game and non-game, are collected at two types of sites with respect to Los Alamos National Laboratory:

- upstream: a combination of fish from Abiquiu dam, Heron dam, and/or El Vado dam
- downstream: Cochiti Lake.

Number of samples

Collect 5 to 10 composite fish samples at both upstream and downstream locations:

	Heron, El Vado, or Abiquiu Dams	Cochiti Lake
For Radiochemical Analysis		
Game Fish	5 to 10	5 to 10
Non-Game Fish	5 to 10	5 to 10
For Mercury Analysis		
Game Fish	5 to 10	5 to 10
Non-Game Fish	5 to 10	5 to 10
For Organics Analysis		
Game Fish	5 to 10	5 to 10
Non-Game Fish	5 to 10	5 to 10
Note: The project leader uses professional judgment to determine the number of samples collected for both composite and individual fish samples at each sample site. Budget constraints and/or time limitations could be factors in the determination.		

Sample Collection, continued

Equipment needed

Additional specific equipment needed for going on the lake with the boat is given in the operating procedure for boat and rafts (MAQ-710).

The following equipment is needed for fish sampling:

- first-aid kit and sunscreen
- cellular telephone and/or radio
- rubber gloves that cover the forearm
- safety glasses (polarized sunglasses)
- boat shoes or similar soft-soled shoes with good grip on wet surfaces
- life vest
- hat
- ice chest with ice
- sharp knife and Kevlar safety gloves for use with knife
- wooden block to cut fish on
- zip-lock sample bags (gallon size) and large trash bags
- marker for labeling bags
- fishing equipment (gill nets, rods-and-reels)
- chain-of-custody forms

The following items are needed in addition to the above list when sampling for organics analysis

- digital camera
- pre-labeled amber glass screw-top jars
- form “Fish Collection Locations and Physical Characteristics” (attachment 2)
- Sufficienct chain-of-custody forms created according to MAQ-708

Before leaving LA County

Identify a Point-of-Contact (providing pertinent information of destination, expected time-in, and how to notify field team). When leaving Los Alamos County, notify group office to place you on travel status. Check conditions of vehicle, trailer, and boat for safe operation. Ensure that you have a working cell phone and a pager.

Travel to sampling lakes

In late spring/early summer, travel to the sampling locations at Cochiti and at least one of the upstream lakes to collect fish for analysis. At each lake, begin by following the boat/raft launching instructions in MAQ-710.

Sample Collection, continued

Steps for harvesting fish

To collect fish using gill nets at lakes, perform the following steps:

Step	Action
1	Identify several sampling locations at different parts of the lake where nets can be set.
2	At each location, anchor one end of the net to a fixed point (e.g., a partially submerged tree). Stretch the net and attach a weight to the bottom of the net at the other end and a float to the top. This float-weight system is effective for maintaining proper positioning of the net.
3	Return to the net location no more than 24 hours later; carefully raise the net from the water (avoid entangling the net), and remove fish from the net. Place all live fish into a holding tank with water.
4	Collect about 5 to 8 kg (11 to 18 lb fresh weight) of each species.
5	After all the fish have been collected, euthanize fish that are still alive: • stun the fish by clubbing them on the head with a small wooden bat called a priest. • decapitate the fish on a wooden block. **Wear Kevlar gloves**. • double pith (severe the spinal cord in both the body and decapitated head with a dissecting needle).
6	Place the fish in large plastic bags labeled with sampling location and date. Pack the fish on ice for transport back to the Laboratory.
7	Complete a chain-of-custody form (created before departure according to MAQ-708) with the appropriate sampling information. Maintain proper chain of custody on the samples. See chapter *Chain-of-custody for samples*.
8	Clean the net and neatly roll it for storage.
9	Once at the lab, store the samples on ice or in a freezer until they are processed (normally within two working days). Follow preparation and processing methods described in MAQ-706 (Processing and Submitting Samples).

Sampling for organic analysis

Some fish are collected for organic analysis and are handled differently than the regular sampling. Follow steps below.

Step	Action
1	Keep the largest fish (minimum 35g fwt).
2	Photograph each site using digital camera.
3	Fill out chain-of-custody form with appropriate sampling information. Maintain proper chain-of-custody on the samples. See chapter *Chain-of-custody for samples*.

Step	Action
4	Fill in as much as possible of the Fish collection Locations and Physical Characteristics (Attachment 2); complete the form at the lab.
5	Place whole fish into pre-labeled 500 mL amber screw-top jars. Cut fish into smaller portions if necessary to fit into container.
6	Place samples into ice-filled chest for transport to the laboratory.
7	Once at the laboratory, keep cool or frozen and in the dark until submittal to analytical laboratory. Follow preparation and processing methods described in MAQ-706 (*Processing and Submitting Samples*).

Chain-of-custody for samples

Maintaining custody of samples

A sample is physical evidence collected from a facility or the environment. Chain-of-custody must be documented for all samples used to demonstrate compliance. Verify that the possession and handling of samples is traceable at all times. A sample is considered in custody if it is one of the following:

- In one's physical possession.
- In one's view after being in one's physical possession.
- In one's physical possession and then locked up so that no one can tamper with it.
- Kept in a secure area where access is restricted to authorized and accountable personnel only.

NOTE: A secured area is an area that is locked, such as a room, cooler, vehicle, or refrigerator. If the area cannot be secured by locking, use a custody seal to secure the area or the sample container.

Transferring custody of samples

Whenever samples are transferred into the custody of another person or organization, complete the "relinquished by/received by," "date," and "time" sections of the form. These sections of the form must provide a complete history of custody of the samples from collection to transfer to the analytical laboratory.

If chain-of-custody is broken

Whenever there is a break in the chain of custody of a sample, document the failure by initiating a deficiency report in accordance with the procedure for deficiencies (MAQ-026). [The deficiency process will document the occurrence, evaluate the potential impact (if any) on the samples, and propose a fix to prevent recurrence.]

Records resulting from this procedure

Records

The following records generated as a result of this procedure are to be submitted **within one year** as records to the records coordinator:

- Chain-of-Custody record (created according to MAQ-708)
- Fish collection Locations and Physical Characteristics (Attachment 2)

HAZARD REVIEW FOR FISH SAMPLING

Work tasks/Steps	**Hazards, Concerns, and Potential accidents; Likelihood/ Severity**	**Controls, Preventive Measures** *(e.g., safety equipment, administrative controls, etc.)*	**Hazard Level** *from IMP 300-00-00 Hazard Grading Matrix*
Task: Collect samples as described in this procedure.	See IWD for this work.	See IWD for this work.	Moderate

Wastes or residual materials resulting from process

After processing, bag all fish parts not used in the analysis and dispose at the LA area landfill. Do not place fish parts into any dumpster.

Emergency actions to take in event of control failure

For all injuries, provide first aid and see that injured person is taken to Occupational Medicine (only if immediate medical attention is not required) or the nearest hospital. Notify supervisor and group office as soon as possible.

Meteorology and Air Quality Group, MAQ

FISH COLLECTION LOCATIONS AND PHYSICAL CHARACTERISTICS

This form is from MAQ-702

Date	Sample No.	Site	GPS Location	Species	Weight	Length	Girth

Samples collected by:

Signature	Name (print)	Z no.	Date

Field team member:

Signature	Name (print)	Z no.	Date

Field team member:

Signature	Name (print)	Z no.	Date

Field team member:

Signature	Name (print)	Z no.	Date